



IAE Common Services Platform Architecture

**Industry Day Event
March 24th, 2015**





Welcome!



- We look forward to a dialogue today. You will have the opportunity to post questions throughout the presentation. We will post a summary of the questions and answers after this event.
- You can download this deck by selecting it under “Files” and clicking “Download File(s)” any time during this presentation.
- We will also be posting this deck and other related documents in the near future to the Interact site
- You can always contact us at IAEOutreach@gsa.gov



Today's Presenters



- **Karen Kopf, Assistant Commissioner (Acting), IAE**
- **Navin Vembar, IAE IT Director, GSA IT**



Overview



- **Welcome and IAE Overview**
- **The Common Services Platform**
 - **Architecture Overview**
 - **Component Details**
 - **Processes**
- **Integrating Applications into the CSP**
- **Our Next Steps**



IAE Mission



The IAE Mission is to support a common, secure business environment which facilitates and supports cost-effective acquisition of, and payment for, goods and services; effective management of federal acquisition and assistance awards; and consistent transparency into federal acquisition and assistance awards



IAE Vision



The IAE Vision is to continue to evolve and integrate the existing shared portfolio of 10 electronic systems used for awarding and administering federal financial assistance (i.e., grants, loans) and contracts.

The largest and most complex of the E-Government initiatives, the IAE works on behalf of the acquisition and financial assistance communities to save money, be more efficient, reduce burdens on the communities we serve, and improve federal award management.



IAE Values



The IAE Values include employing agile business and systems processes in order to:

- **Drive continuous innovation and improvement;**
- **Serve as active and engaged stewards of federal award data;**
- **Enable collaboration across the federal government;**
- **Protect the quality and integrity of the data; and**
- **Embrace openness and transparency**



IAE Today



- **How IAE works**
 - IAE is governed by the Award Committee for E-Government (ACE) within the CAO Council
 - IAE is co-led by FAS and GSA-IT within GSA
- **Scope of IAE environment (FY14)**
 - Contains information about 538,000 entities
 - Tracks more than \$1 trillion in federal assistance and awards from 3.3M transactions
 - More than 3.4 million users; 1.8M entity management records in SAM alone, of which 538,000 are active registrants
 - 500M+ hits or page views per month, including an average of almost 1.25M searches each week in SAM alone

Current IAE Environment

1. SAM today includes

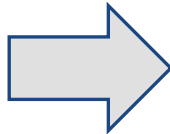
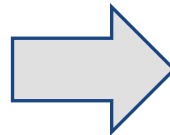
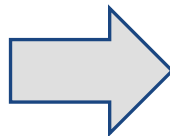
- CCR
- ORCA
- EPLS
- FedReg

2. Past Performance Systems

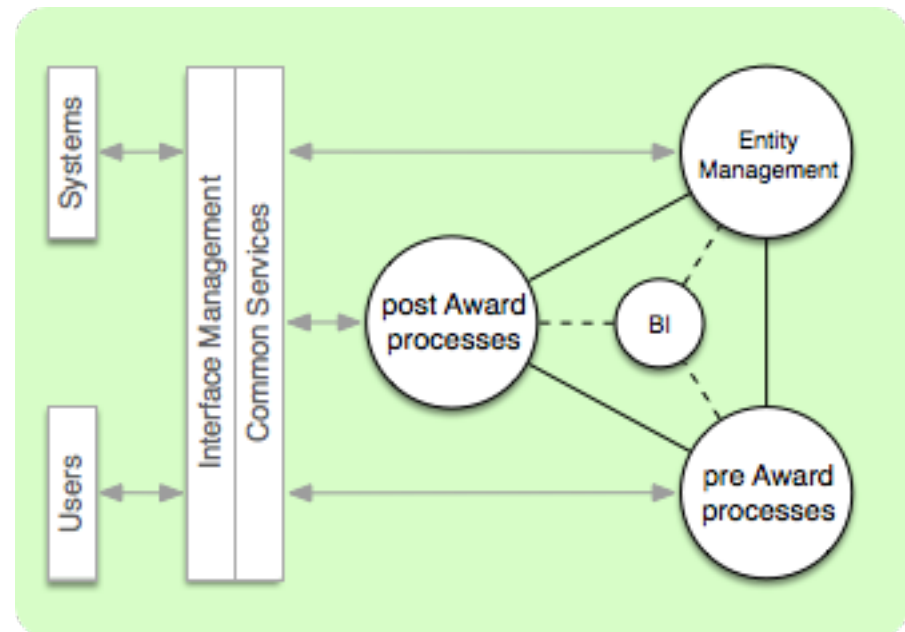
- PPIRS
- CPARS
- FAPIIS

3. Other Systems

- eSRS
- FSRs
- FedBizOpps
- FPDS-NG
- CFDA
- WDOL



Future IAE Environment



IAE Architectural Principles



- **Be open**
- **Treat data as an asset**
- **Use continuous improvement to drive innovation**
- **Provide an effective user experience for all stakeholders**
- **Business transactions must be time- and cost-measurable**
- **Treat security as foundational**
- **Build value over maintaining status quo**

These principles are a technical response to the business drivers that affect the IAE program and the stakeholders we serve



The Common Services Platform

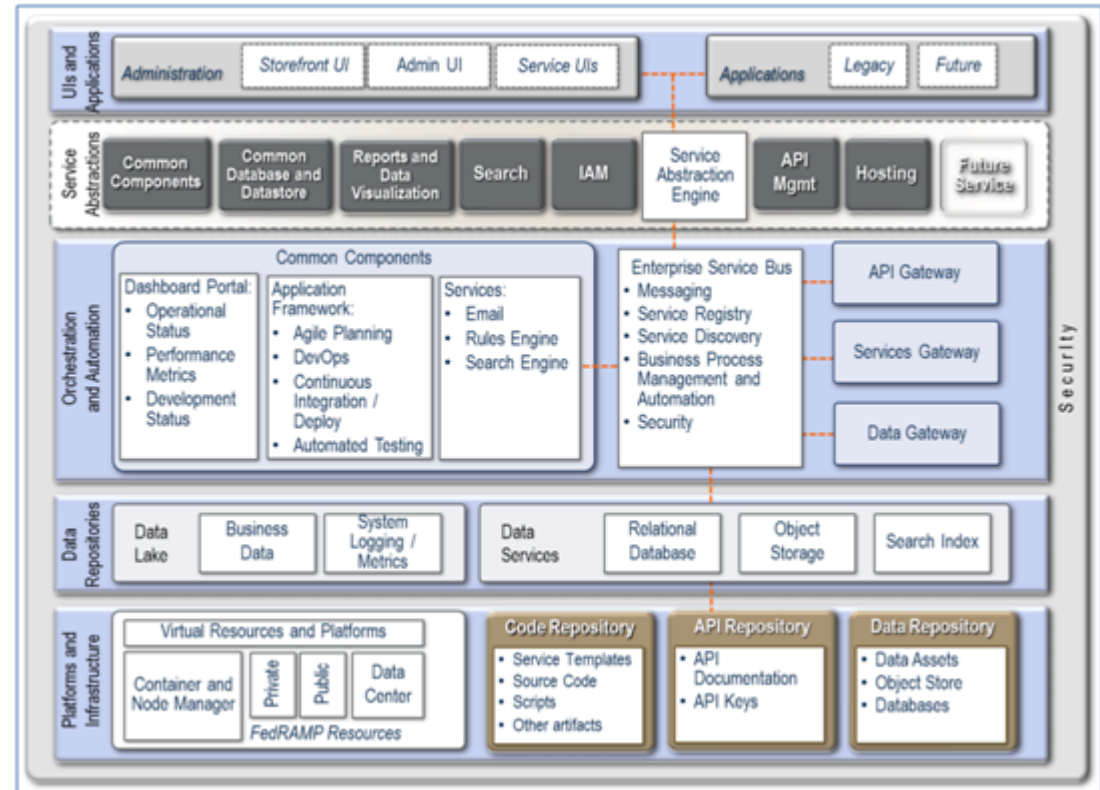


CSP Architecture Drivers

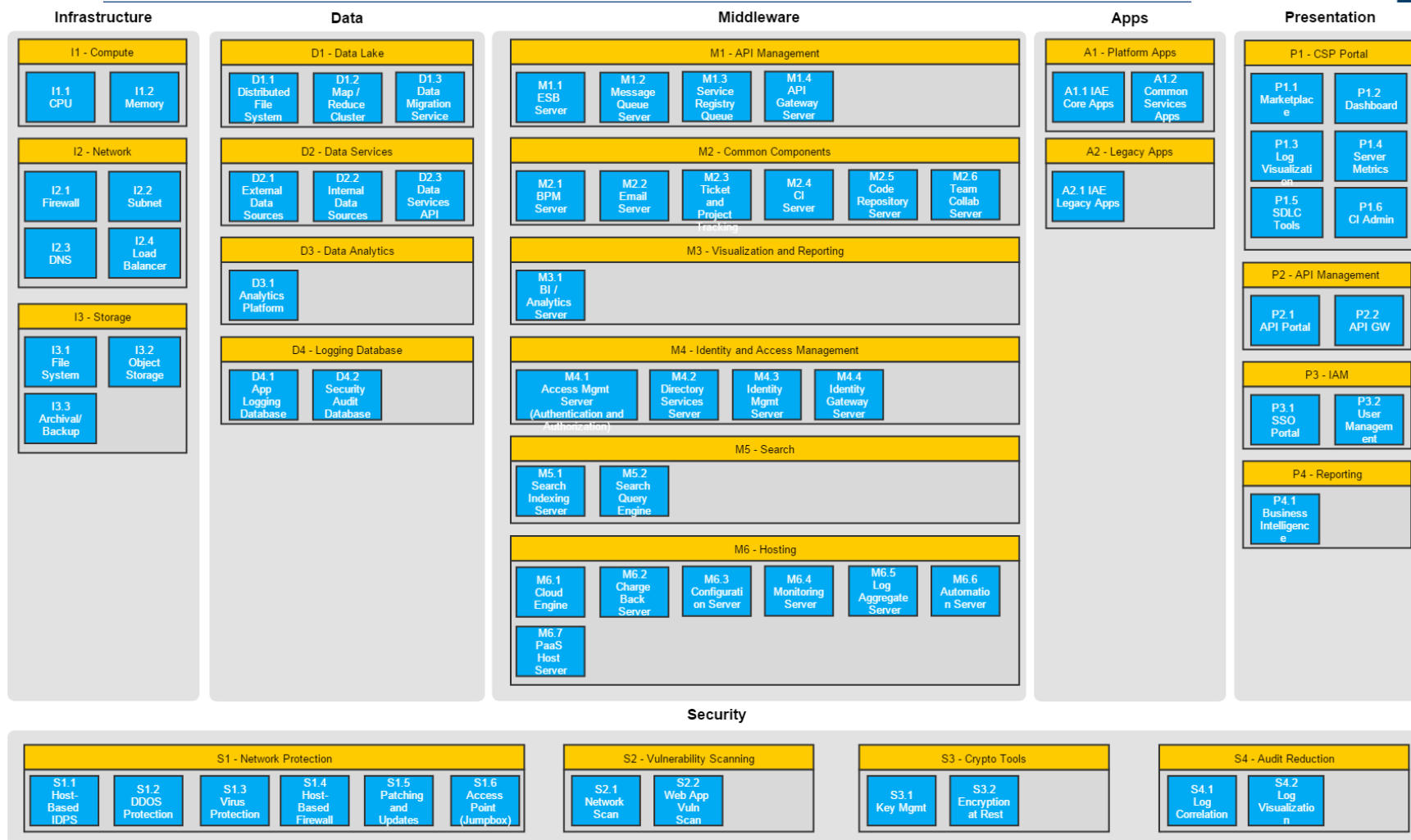
- **Actually Cloud-y**
- **Continuous Integration in service of quality delivery**
- **Secure by design**
- **Complete capabilities for developers**
- **Data is king**
- **Evolutionary change**

CSP Conceptual Architecture

- High-level view of the components
- Some of these are multi-tenant, some single-tenant
- Architecture will guide tools that Core Devs can use
- CI (and, eventually, CD) are key components



Component of the CSP Logical Architecture



Components of logical architecture are grouped by architecture layer and are uniquely identified

- Infrastructure – Provides IaaS on Cloud Provider
- Data – Data repositories support both core applications and the CSP
- Middleware – The full set of common services for core applications and end-user

- Apps – Hosting / Containers for core applications and legacy apps
- Presentation – Front-End interfaces provided by the CSP for end-user access

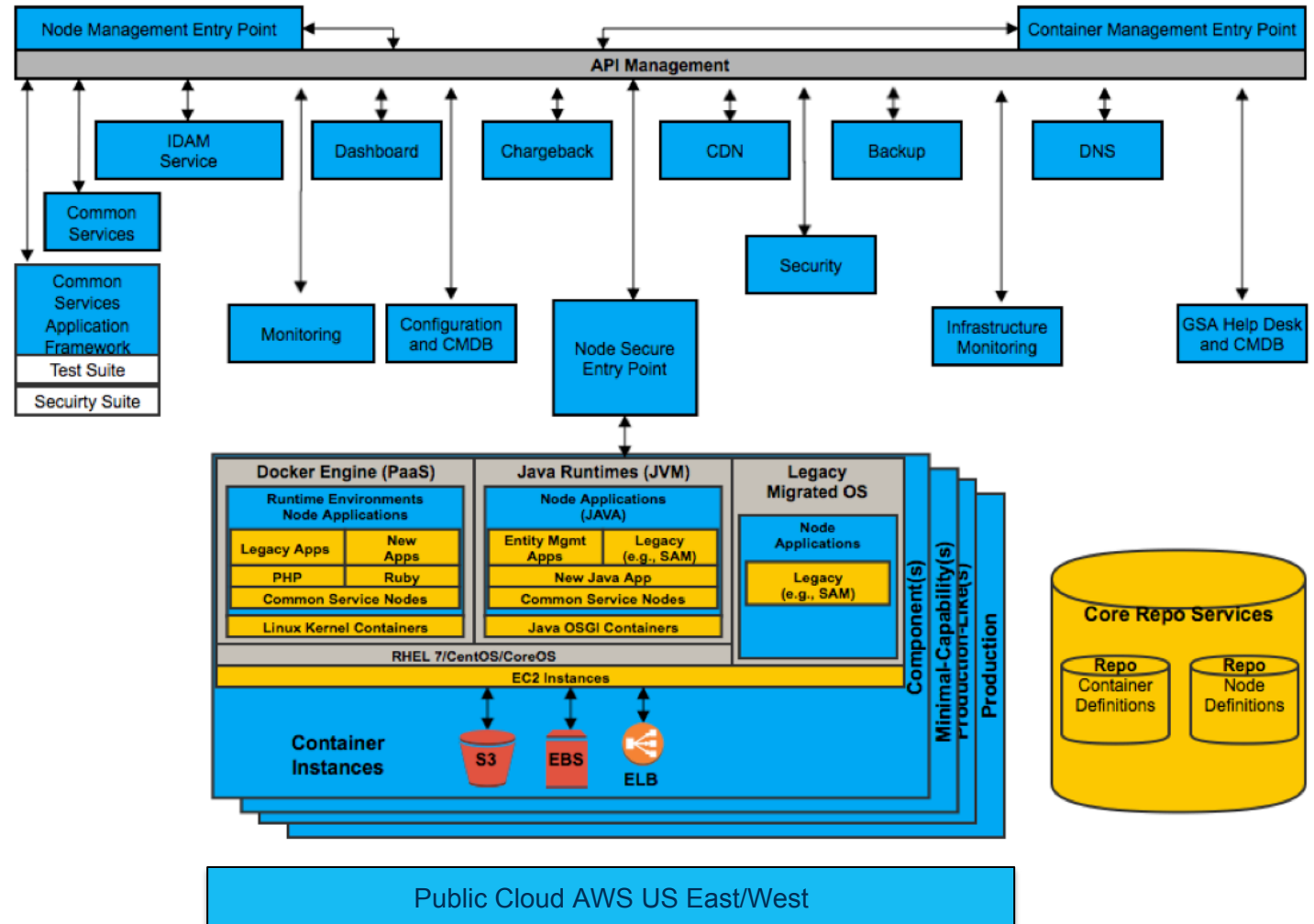
Key Points

The hosting services provides:

- Management services that oversee the deployment and monitoring of the CSP
- Application Containers for application hosting within Docker Containers

Only core applications are hosted in Docker. Migrated legacy services will be deployed directly to IaaS

Core applications will have an application service within the Docker container



CSP Common Components Architecture

Key Points

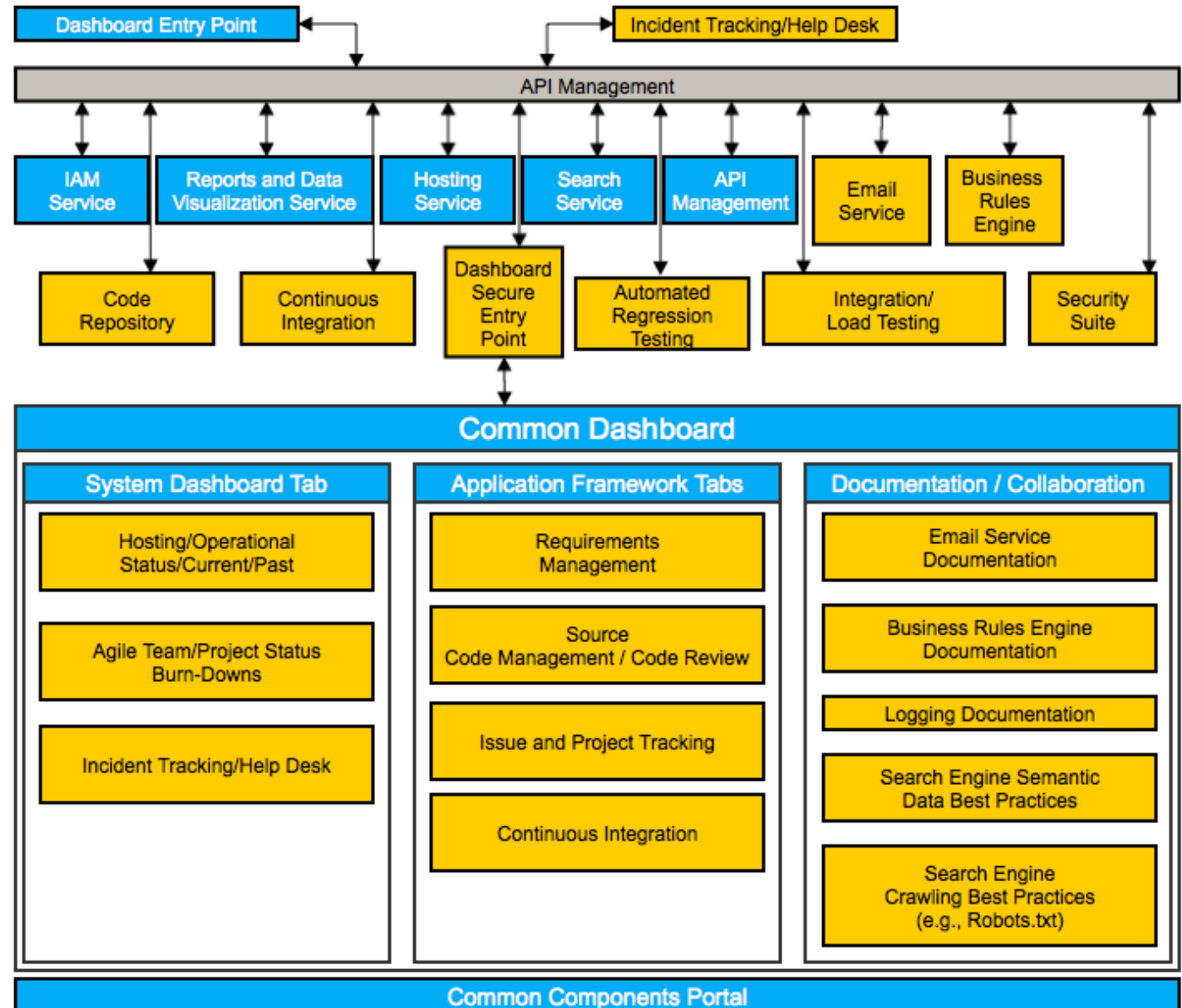
The common components provides single-pane-of-glass administration of the environment. Key components are:

- Marketplace
- User Management
- Data Lake Management
- API Management
- Development Tools

The marketplace manages orgs, projects, and apps and allows services to be provisioned (based primarily on Booz Allen's Open Source product: JellyFish)

The User Management integrates with IAM solution to manage CSP users and entitlements

The Data Lake Management provides visibility into analytics jobs and reports



Key Points

IAM architecture ensures appropriate security for both vertically and horizontally

Manages each type of user access at each layer of the architectures

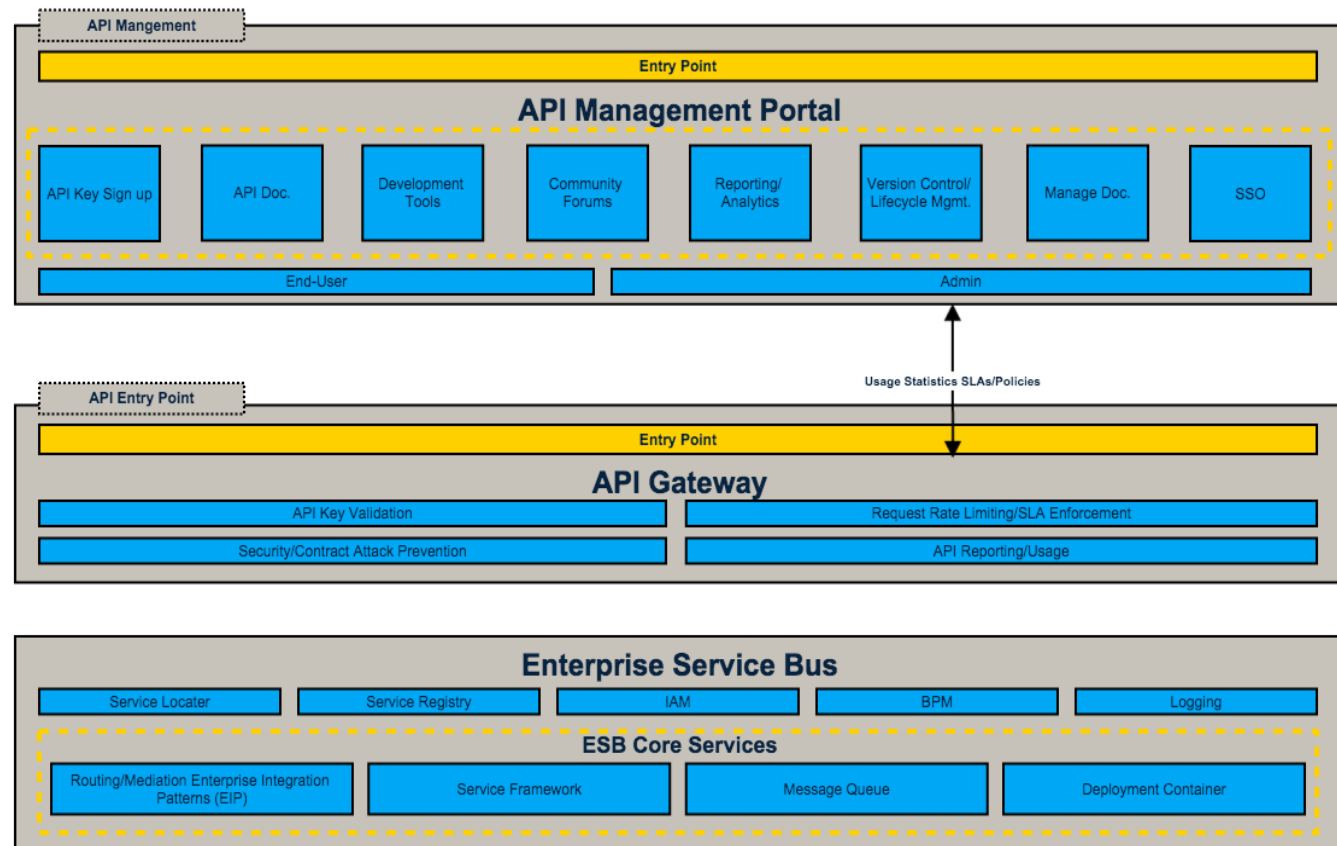
Provides centralized user, role, and entitlement management

API Management (M1) solution is made up of three main components

- Management Portal
- API Gateway Enterprise Service Bus

Core applications that are publicly consumable are routed through the gateway and management portal.

Internal Common Services are accessible to core applications



Key Points

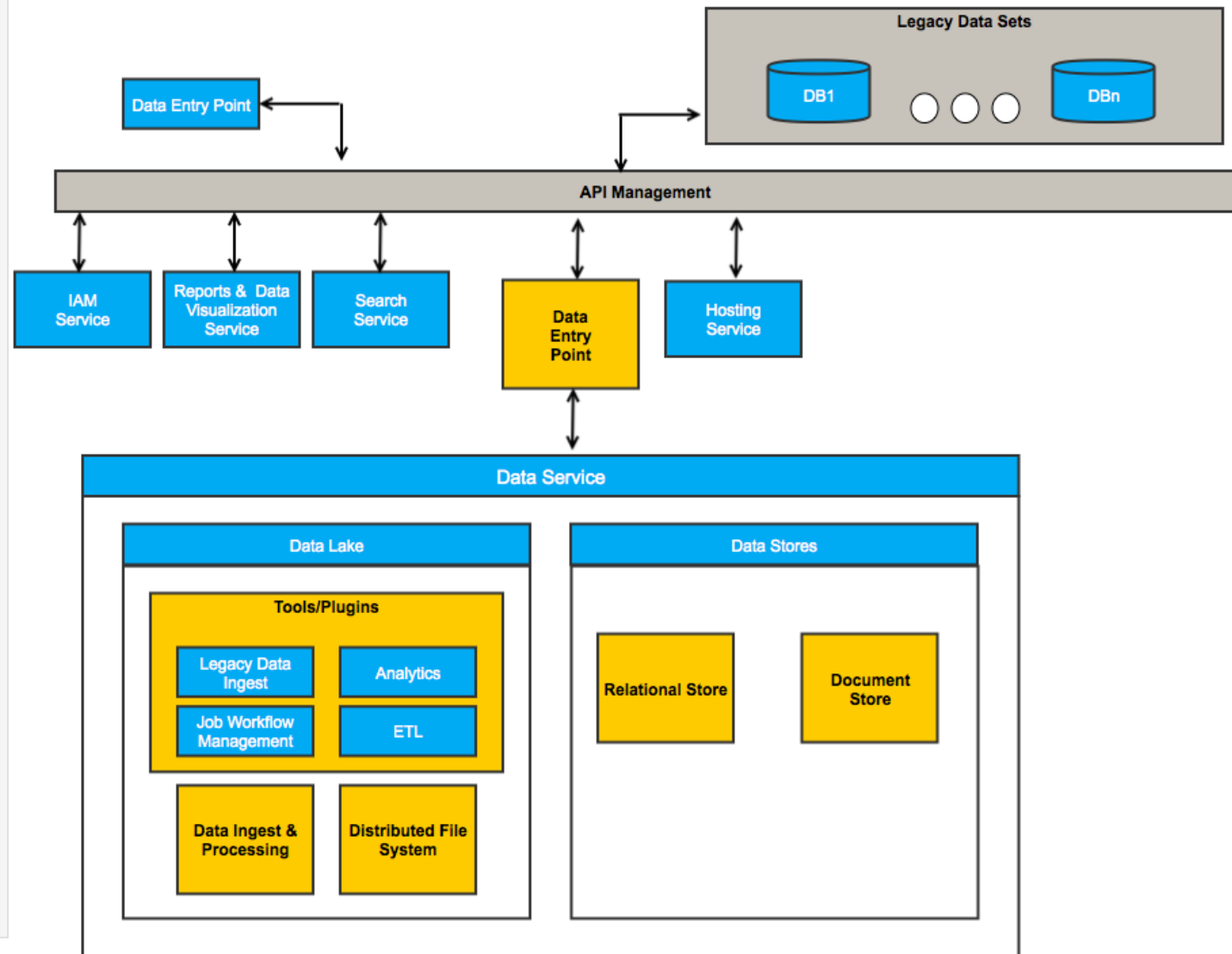
Data and Related Services consist of

- RMDS
- Document/Object Data Lake (HDFS/Hadoop)
- Search
- Reports and Visualization

RDMS and Object Store are dedicated per-application services.

Applications communicate through each others APIs

Data from each data source are aggregated into the Data Lake for analytics and reporting



Using the CSP as an Application Developer



Interacting with the CSP



- The CSP and the IAE architecture are designed to create guardrails around development
- Though we want your creativity, the CSP won't provide full flexibility for developers
- We chose one platform to maintain vs highly heterogeneous environments
- Another advantage: Cores will inherit many security controls from the CSP
 - Simplifies ATO process for applications

Developer Interaction with CSP

- **Developers using platform starting in June (IOC)**
 - Java as first supported development language
 - Developer Marketplace allows selection of service dependencies (products)
 - Initial set of services for development (hosting, IAM, data, API management, and dev tools)
- **Infrastructure-as-code allows developers to focus on building applications**
 - Application Servers managed as Docker containers
 - Docker containers run minimal services to support hosting applications (i.e. No SSH.)
 - Managed in code repository and integrated with continuous integration / continuous deployment

Development Cycle Flow

- **View App in Marketplace**
- **Download Image for local testing (Optional)**
- **Provision instance of Development Environment**
- **Assemble application node from code repository**
- **Deploy node into container**
- **Production deployment done through DevOps via GitFlow**

- The marketplace is the primary way developers will use the CSP
- We want developer feedback to make the best marketplace for you

GSA IAE Raj Boopathy (rajboopathyADM) Manage Users Logout

Common Services ^

- >_ AWS Console
- ↑ Chef
- GitHub
- HortonDataWorks
- Jenkins
- Jira/Confluence
- Kibana/Logstash
- Mashery
- PowerDNS
- Sensu Dashboard

Files

Create Directory

Name	Owner	Operations
.Trash	testadmin	<button>Preview</button>
.staging	testadmin	<button>Preview</button>
data	testadmin	<button>Preview</button>
demo	testadmin	<button>Preview</button>
oozie-oozi	testadmin	<button>Preview</button>
railsDir	testadmin	<button>Preview</button>
test	testadmin	<button>Preview</button>
uploadText.txt	testadmin	<button>Preview</button>
wdol	testadmin	<button>Preview</button> <button>Search DBAs</button>

The actual Marketplace UI will look different than the prototype shown here

- Notional view of how a Marketplace would look like

The screenshot displays the Project Jellyfish Marketplace interface. The top navigation bar includes the Project Jellyfish logo, a user profile section with 'Welcome Admin Staff', and a power button. A left sidebar contains navigation links: DASHBOARD, MY PROJECTS (with a red badge showing '8'), ORDER HISTORY, MARKETPLACE, and ADMIN. The main content area is divided into three sections: INFRASTRUCTURE (Available Infrastructure), PLATFORMS (Available Platforms), and DATABASES (Available Database). Each section contains a grid of service tiles with icons and labels.

INFRASTRUCTURE
Available Infrastructure

- Small AWS
- Medium AWS
- Large AWS
- RHEL 6 Large VMware
- RHEL 6 Medium VMware
- RHEL 6 Small VMware
- Apache Web Server OpenStack

PLATFORMS
Available Platforms

- LAMP Stack AWS
- LAMP Stack VMware
- Rails Stack AWS
- MEAN Stack VMware
- MS Exchange Server Azure

DATABASES
Available Database

- Medium MySQL
- Medium PostgreSQL
- Large PostgreSQL
- Medium Aurora
- Large SQL Server
- Small MySQL

Note:

- Not all the features listed in the open source product JellyFish will be used for the IAE
- The developer tools offered for IAE may vary from the ones displayed on this page

Evolving the CSP

- **The first core developers will help us by providing feedback on the capabilities and UX of the marketplace**
- **The first available version of the CSP will be made available to developers on GitHub in June 2015 - it will not be feature-complete, but usable to deploy applications**



Conclusion & Next Steps



- **The Common Services Platform is our new PaaS that all future applications for IAE will be deployed onto**
- **The plan is to make the UX for developers smooth enough to enable rapid development of applications**

Next Industry Meeting

Stay Tuned!

**Information on the next
Industry Day will be available
shortly - keep checking in with
the IAE industry community on
Interact for details**



How You Can Contribute



- View the presentation on the [IAE Industry Community](#) on interact.gsa.gov
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